



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,527	04/09/2004	Chung-Gil Yang	8021-214 (SS-19177-US)	1286
22150	7590	01/26/2006	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			NGUYEN, HIEU P	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/821,527

Applicant(s)

YANG ET AL.

Examiner

Hieu P. Nguyen

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-19 is/are allowed.
- 6) ☒ Claim(s) 1-2, 7 and 9-10 is/are rejected.
- 7) ☒ Claim(s) 3-6, 8 and 11-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7, 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant's admitted prior art (Botti et al., US 6489840).

Regarding claim 1 and 9, Fig. 6 of Botti discloses a method as well as a structure of class-D power amplifier (similar to Fig. 1 of Applicant) comprising: a summing circuit (summing node), which outputs an error signal by summing an input signal (c) with one of a first negative feedback signal (RF1) and a second negative feedback signal (RF); an integral control circuit (01), which outputs an integral signal by integrating the error signal; a feedback control circuit (6), which generates and outputs a switching control signal whose logic state changes according to the logic state of an abnormal state detecting signal generated in response to a monitoring signal (En); a switching circuit (S), which switches the integral signal to one of a sub-loop and a steady-state loop in response to the switching control signal; a sub-negative feedback circuit (RF1), which receives and processes the integral signal and generates and outputs a sub-negative feedback signal as the first negative feedback signal; a controlled circuit (20), which receives and modulates the integral signal into a pulse width modulation (PWM) signal and generates an output signal; and a steady-state negative feedback circuit (RF), which receives and processes the

Art Unit: 2817

output signal from the controlled circuit and generates and outputs a steady state negative feedback signal as the second negative feedback signal.

Regarding claim 7, Botti discloses everything claimed as applied to claim 1. In addition, Botti [col. 1, lines 32-42] further discloses the class-D power amplifier, wherein the PWM signal maintains a pulse width that is half (duty-cycle of 50% in absence of input audio signal) the pulse width of the PWM signal in a steady-state when the input signal is a fog signal, after the logic state of the switching control signal changes according to switching the integral signal from the sub-loop to the steady-state loop.

Regarding claim 10, Botti discloses everything claimed as applied to claim 9. In addition, Botti discloses a method of a class-D amplifier, wherein step of “receiving and modulating the integral signal into a pulse width modulation (PWM) signal and outputting an output signal” comprises: modulating the integral signal output (see detail of Fig. 6, signal sq) to the steady-state loop into the PWM signal using a sawtooth wave signal and outputting the PWM signal; outputting an amplified signal according to the PWM signal; and outputting the output signal (see Fig. 6, signal Vout) generated by performing low-pass filtering (Fig. 6, filter: 3) on the amplified signal.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Botti in view of Danz et al. (US 5805020).

Regarding claim 2, Botti discloses everything claimed as applied above. In addition, Botti [col2, lines 49-65] discloses a class-D power amplifier, wherein the controlled circuit comprises a PWM modulation chain that is not shown in Figures. Botti doesn't disclose in detail the PWM modulation chain. However, Danz [col. 1, lines 22-27] discloses that a class D amplifier requires a modulator, switching circuit and an output filter.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to analyze "the PWM modulation chain" as a class D amplifier comprises a PWM circuit, which modulates the integral signal output to the steady-state loop into the PWM signal using a sawtooth wave signal and outputs a PWM signal; a switching amplification circuit, which outputs an amplified signal using switching according to the PWM signal; and a low-pass filter (LPF) circuit, which receives the amplified signal and outputs a low-pass filtered signal generated by performing low-pass filtering on the amplified Signal.

Response to Arguments

Applicant's arguments filed 12/12/2005 have been fully considered but they are not persuasive.

Since applicant doesn't disclose from where "the monitoring signal" is derived (e.g., output) or from which part of the circuit it monitored (e.g., a physical connection between the signal and the output), therefore the enable signal (En) from Botti's circuit can be read as "an abnormal stage detecting signal" that is generated from a monitoring signal (not shown), meeting

Art Unit: 2817

the claimed language of “a feedback control circuit, which generates and outputs a switching control signal whose logic state changes according to the logic stage of an abnormal stage detecting signal generated in response to a monitoring signal” in both claims 1 and 9.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Allowable Subject Matter

Claims 17-19 are allowed.

The following is an examiner’s statement of reasons for allowance:

Claims 17-19 are allowed over the prior art of record. The prior art of record, considered individually or in combination, fails to fairly teach or suggest the claimed circuit comprising, among other limitations and unobvious limitations of “a feedback controller comprising: a sawtooth wave signal generator for generating a sawtooth wave signal; a slope detector for

generating a signal representing the slope of the sawtooth wave signal; an abnormal state detector for generating an abnormal stage detection signal in response to a monitoring signal; and a feedback decider for generating the control signal in response to the abnormal stage detection signal” structurally and functionally interconnected with other limitations in the manner as cited in the claims.

Claims 3-6, 8, 11-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner’s statement of reasons for allowance:

Regarding claim 3-6, the prior art of record fails to disclose or suggest a structure of a class-D power amplifier, wherein the feedback control circuit comprises: a “slope detector” in combination with the rest of the limitations of the claim(s).

Regarding claim 8, the prior art of record fails to disclose or suggest the class-D amplifier, wherein “the pulse width of the PWM signal is the same pulse width as the pulse width of the switching control signal when the integral signal is switched from the sub-loop to the steady-state loop.” in combination with the rest of the limitations of the claim(s).

Regarding claim 11-16, the prior art of record fails to disclose or suggest the amplification method of a class-D power amplification comprising: “generating and outputting a signal representing the slope of the sawtooth wave signal” in combination with the rest of the limitations of the claim(s).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu Nguyen whose telephone number is 571-272-0218. The examiner can normally be reached on M-F 8-5.

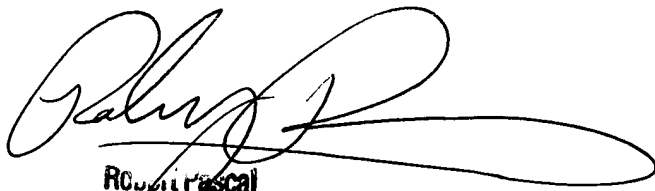
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hieu Nguyen
AU: 2817

Robert Pascal
Primary Examiner

hn



Robert Pascal
Supervisory Patent Examiner
Technology Center 2800